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GEOGRAPHICAL RECORD

NORTH AMERICA

The Aërial Defense of the Coasts of the United States. To the two traditional branches of our national defense service it is now proposed to add a third. It is argued by Rear Admiral Robert E. Peary, and the present war has fully demonstrated the strength of his contention, that the command of the land and the sea is more than worthless, it is impossible, without the command of the air. The Sheppard-Hulbert Bill, before Congress, would provide a Department of Aëronautics, and through this it is proposed to develop a comprehensive aëro coast-defense system of patrol. The system would comprise a continuous cordon of sentinel planes a hundred miles or more off the coast and large aëro-squadron stations near all the principal coastal cities, to protect the cities from air raids and to carry out offensive operations against hostile fleets and their attendant air squadrons. The air scouts would also convoy merchant and troop ships, serve as the eyes of mine layers, search out submarine bases in highly indented coasts, locate submerged mines, and assist ordinary craft in naval engagements. At least two thousand sea planes are required for each coast. The *Emden*, the *Moewe*, the *Appam*, and other raiders have demonstrated that it is easy for enemy craft, under cover of night or thick weather, to creep close inshore unperceived. A single one of these steamers could bear fifty warplanes. In addition, each of the larger enemy submarines could carry planes, equipment, and ammunition. In the face of these real dangers, and in line with the development of air service abroad, the tactical study of air control and the meteorological factors involved is one of the major defense problems of the day. (For details see the following articles by Rear Admiral Peary: Command of the Air, *Senate Document No. 687, 64th Congress, 2nd Session*, Washington, 1917; Air Power for the United States, *Saturday Evening Post*, May 12, 1917, pp. 10 *et al.*; also a report of the Advisory Committee on Aëronautics by Murray Hulbert in the House of Representatives, April 13, 1917, printed in the *Congressional Record*.)

Food Production on Reclaimed Land in the West. Secretary Lane of the Department of the Interior has issued an appeal and a warning to the owners of unused but reclaimed land in the West. There are 700,000 acres of land on government projects for which reservoirs have been built, water accumulated, and ditches dug, but which have not been put under cultivation. It is estimated that this land would produce fifteen million dollars' worth of food each year, or an amount capable of feeding twenty thousand families and also an entire army division at the front. The lands now belong to private owners, but Secretary Lane warns them that no one is at present entitled to that which he does not use and that if the property is not made food-producing the time may not be distant when confiscation and government cultivation may be necessary (*Official Bulletin* [the new government organ, published daily by the Committee on Public Information, which is "designed to inform the public on the progress of the war and of official acts incident to its prosecution"], May 10, 1917, Vol. 1, No. 1, p. 3.)

The Opening of the Hell Gate Bridge in New York City. On April 1 the Pennsylvania Railroad Company opened the Hell Gate Bridge. With its single span of 1,000 feet this is the greatest arch bridge in the world. It has, however, an interest beyond that of a great engineering achievement: it is a work of national importance. Its completion permits an all-rail route along the entire Atlantic coast of the United States from Key West to the Canadian border and beyond to St. John, Halifax, and Sydney, Cape Breton. Heretofore transportation along this route has been broken by the water barriers that surround New York City. The stages by which they have been overcome—the train-ferry carrying the "Federal Express," the Hudson and East River tunnels—are indicated by Ellsworth Huntington in his article "The Water Barriers of New York City" (*Geogr. Rev.*, September, 1916). The map accompanying the article shows the location of the bridge: it unites the mainland in the southern part of Bronx Borough with the northern shore of Long Island via Ward's and Randall's Islands and thus provides connection with the main line of the Pennsylvania Railroad. Today the strategic consequences of the opening of the bridge are perhaps the most arresting, yet the facilitation of commercial movement should not be overlooked. By the connecting railways on Long Island and the short car-ferry between Bay Ridge at the extreme west of the island and Greenville Pier on the New Jersey shore freight will be saved the long passage through the East River (S. A. Bonnaffon: Hell Gate Bridge, *Commercial America*, April, 1917).

An Archeological Expedition to One of the Zuñi Pueblos. Our knowledge of the geography of Arizona and New Mexico had its beginning in the report of the journey

of Fray Marcos de Niza in 1539 and in the various chronicles of the famous expedition of Francisco Vazquez de Coronado in the year following. Fray Marcos drew his remarkable outward journey to a close when he viewed from a height in western New Mexico a large pueblo of the Zuñi Indians, that one of the "Seven Cities of Cibola" known as Hawikuh. In 1540 Coronado's advance guard stormed and captured the village, in which action the leader almost lost his life. At this period Hawikuh, or Granada as Coronado named it, consisted of 200 houses, or probably 800 to 1,000 inhabitants. In 1629 the pueblo became the Franciscan mission of La Concepción, and in 1670 it was raided by the Apache or the Navaho, the priest killed, and the pueblo abandoned, although it may possibly have been occupied from time to time during the next ten years, but certainly not after the great Pueblo revolt of 1680.

After this lapse of 237 years, Hawikuh is about to take on new life, so to speak, for a joint expedition has been organized by the Museum of the American Indian, Heye Foundation, of New York, and the Bureau of American Ethnology of the Smithsonian Institution at Washington, for the purpose of completely excavating the ruins of this extensive settlement. The work will be conducted under the personal supervision of Mr. F. W. Hodge, Ethnologist-in-Charge of the Bureau of American Ethnology, assisted by Mr. Alanson Skinner of the Museum of the American Indian. By reason of the fact that Hawikuh was inhabited from prehistoric times until 130 years within the historic period, its ruins afford an excellent opportunity for a study of the effect of contact on the Indians by the early Spanish explorers and missionaries, as well as of the culture status of the Zuñi people at the time they first became known. The expedition has been made possible largely by the patronage of Mr. Harmon W. Hendricks, a trustee of the Museum of the American Indian, who has generously offered to bear the field expenses during the season of 1917.

SOUTH AMERICA

The Impending Rapprochement of Chile and Peru. The early renewal of diplomatic relations between Chile and Peru, recently forecast in the press (*New York Times*, April 20, 1917), recalls what is doubtless the most interesting problem in political geography in all South America. The rich and disputed nitrate territory of northern Chile, forcibly seized by that nation in the war with Peru in 1879-83, was never returned to its owner. A promised plebiscite was never held. Each nation has accused the other of "planting" colonists in the disputed territory against the day when a deciding vote should be taken. First one nation and then the other has concentrated troops in the direction of the frontier for years. Among minor troubles may be mentioned a single episode in 1911. Dock laborers at Mollendo refused to unload Chilean vessels for several days, with the result that cargoes destined for Bolivia were carried to Valparaiso and back again, at the consignee's expense. Riots at Arica and Iquique in the same year were followed by the return of Peruvian settlers. In spite of the threat of war, fat revenues have accrued to the Chilean treasury.

Bitterness between the two neighboring countries has been marked by the resignation of one Peruvian ambassador after another as each failed to secure the return of the "unredeemed" national lands. So the Tarapacá-Taena region has been called the Alsace-Lorraine of South America. But both nations are small and relatively weak, and in later years, with Peru and Colombia in serious and, at one time, in armed dispute over the Putumayo rubber country, the nitrate region resembled rather the Balkan hotbed than Alsace-Lorraine. Thanks to the present war the principle of sympathetic co-operation between small states has gained immeasurably in popular esteem. The South American republics have sought friendly counsel of each other. If peace and cordiality should become a mutual and living force in Peru and Chile the hardships which the war has brought their peoples will seem a small price to pay.

Return of Dr. Hamilton Rice's Expedition from the Amazon. Dr. Hamilton Rice, a Councilor of this Society, returned to New York on April 24 from his expedition to the Amazon on the steam yacht *Alberta*, which he had chartered for that occasion (see the December, 1916, *Geogr. Rev.*, p. 467; to the list of members of the staff there given add Dr. Robert A. Lambert, pathologist at the Presbyterian Hospital, New York City; John W. Swanson, wireless expert; John C. Couzens, engineer and in charge of launch).

The Amazon River was ascended to Iquitos in Peru, a distance of 2,100 miles from its mouth, and the upper portion of the river from Manáos to Iquitos, known as the Solimões, was charted and a tracing made of the channel the yacht followed. The navigable course varies greatly from year to year, and it was thought that a series of charts, if taken over a consecutive number of years, would show the tremendous

activity of the river, due to its immense volume, its rapid current, the quantity of detritus it carries, and the quality of the land through which it flows. It is here that lateral erosion and fluvial activity in general can be studied on a stupendous scale.

The *Alberta* is the first yacht to ascend to Iquitos. In 1898 the U. S. gunboat *Wilmington* and in 1909 the British gunboat *Pelorus* went up the river to this point. It was also about 1898 that Commodore Benedict in the *Oneida* ascended as far as Manáos. Ceroncio Mello, an expert who knows the river from Pará to Iquitos, piloted the *Alberta*. He was also pilot of the *Pelorus* on her voyage in 1909. Some idea of the skill and remarkable qualities of the Amazon pilots may be had from the fact that they have no charts but are dependent solely on memory and an extraordinary ability in judging the ever-changing main navigable channel from the condition of the banks and the movements of the currents.

On the return to Manáos from Iquitos the river boat *Inca* was chartered and the Rio Negro ascended to Santa Isabel, 425 miles above Manáos. Lashed to the *Inca* were the launch *Eleanor*, a staunch craft especially constructed for the work by the Seabury Company of New York, and a steel *varenga*, or lighter, employed for extra supplies, fuel, etc. From Santa Isabel to the mouth of the Caiary, or Uaupés, the largest right tributary of the Negro (explored by Dr. Rice in 1907-08), the river bed is filled with rocks, and several *cachoeiras*, or bad rapids, occur, those between Camanáos and São Joaquim forming a stretch of over 30 miles of broken water, foaming rapids, whirlpools, and cross currents. It was impossible to take the lighter beyond Camanáos, but the launch passed up to São Gabriel without accident and fell back again to get supplies from the cache at Camanáos. On the second ascent in one of the first stretches of bad water the launch sustained several bad knocks and a hole was punched amidships on the starboard side, but she managed to reach São Gabriel. Here temporary repairs were made and she was taken down river to Umarituba, where more thorough work was possible. During this delay the river fell steadily, and on the launch's return from Santa Isabel it was impossible to ascend above Camanáos.

An attempt was then made to ascend the Padauiry, a left tributary of the Negro farther downstream, but a huge sandbank completely choked the mouth of the Preto, into which the Padauiry discharges just above the former's confluence with the Negro, and this plan had also to be abandoned. Descent was then made along the north bank of the Negro back to Manáos. It was along this shore that Dr. Alfred Russel Wallace tried unsuccessfully to descend in 1851, and Spence refers to it as *terra incognita*.

The objects of the expedition were: (1) A topographical, hydrographical, and geological survey of the Rio Negro, the investigation of its analogies and differences in relation to the other big tributaries of the main river, and the construction of a detailed map. (2) To test the practicability of receiving signals from Radio, Virginia, with a portable field wireless set, thus simplifying the usual method of determining the differences of meridian distances by employing Washington as the prime meridian with which to compare the field stations of secondary and tertiary meridians. (3) An inclusive investigation of the diseases of the river, their etiology, prevalence, and prevention.

AUSTRALASIA AND OCEANIA

A Unique Grassland in New Zealand. About one-seventh of the occupied surface of New Zealand is characterized by the plant formation known as montane tussock grassland. On the eastern slopes of the Dividing Range it stretches in an almost unbroken band from the Wairau River in the north of South Island to the heavily wooded mountains of Southland, occupying a zone between the agricultural lowlands to the subalpine highlands. Patches of southern beech forest in favored locations are the sole interruptions. This grassland appears to represent the ultimate formation in the natural vegetative cover. Moreover it apparently survives man's intervention in an extraordinary manner. Despite burnings, grazings, and other usually destructive operations it is today little different from what it was half a century ago. Its value, however, is comparatively low; whence arises the question of possible improvement. The carrying capacity, even where supplemented by summer grazing on the subalpine pastures, is not more than one sheep to three acres, and from the total area of six million acres the wool production averages two and a half pounds per acre per year, a return greatly inferior to that from any other of the occupied lands. The nature of the land tenure (short leasehold) and the great size of the individual runs are partly responsible for retarded developments, and as yet no experimental work has been done with a view to determining suitable species for introduction into this distinctly xerophytic grassland (A. H. Cockayne: *Some Economic Considerations Concerning Montane Tussock Grassland*, *Trans. and Proc. of the New Zealand Inst.*, New Issue, Vol. 48, Wellington, 1916).

Exploration in Southern Papua. The Society has received from one of its Life Fellows, Dr. Arthur Wade of Australia, a valuable though brief account of his latest detailed surveys in Papua, or British New Guinea. The communication is dated February 1, 1917. His expedition of 1916 met with new peoples from among the mysterious Kuku tribes, whose customs are extraordinary even for Papua. They inhabit the hill country at the headwaters of the Vailala River and have only recently been persuaded to venture below the rapids that occur at the Puve Hills above the deserted village of Me. In addition to a polished bone piercing the septum of the nose, they insert long vegetable fibers, which give their faces a catlike appearance. Their canoes are simple dugouts without outrigger and are decorated in blood or vegetable stain, with drawings of fish, birds, crocodiles, and their common food plants. Before the time of Dr. Wade's expedition this type of canoe was wholly unknown on the Vailala River, and indeed it is doubtful if it has yet been discovered anywhere else in Papua. The results of the surveys will be represented on topographic maps which will throw light on the structure and origin of hitherto unknown areas. Raised beaches, river terraces, and deserted river beds show that the region has been rising rapidly in recent times and that the movement still continues.

Dr. Wade's former expedition of 1913-14 to the coastal belt about Port Moresby was noteworthy in its results. Three thousand square miles of trackless jungle and sago swamp were surveyed and the coast line between the Purari delta and Yule Island accurately mapped for the first time. The maps, on the scale of 2 miles to the inch, are included in the "Report on Petroleum in Papua" (*Australian Parliamentary Paper, 1914-15, No. 61, F 5163*). This report also contains important short sections entitled "Climate and Health" and "Native Labor."

The discoveries of Dr. Wade again illustrate the unknown character of much of the interior of New Guinea, the second largest island in the world, and enhance the interest in Dr. Eric Mjöberg's proposed aerial expedition, described in the February *Review* for this year.

Abnormal Rainfalls in Australia. From Mr. H. A. Hunt, Commonwealth Meteorologist of Australia, there have recently been received newspaper reports concerning some phenomenally heavy rainfalls in Victoria and New South Wales. About the middle of September, 1916, there began a great drift of warm, moisture-laden air, coming from the equatorial oceans north of Australia, southward over the eastern half of Australia. This movement extended much farther south than usual and was long-continued. Reaching high, and cooler, latitudes, the moisture in the warm air was condensed and fell as rain. For about two weeks a trough of low pressure extended from north to south across eastern Australia. This depression moved very slowly, and this fact accounted, at least in part, for the phenomenal rainfall. The distance traveled by the depression in a week was 500 miles, while the usual rate of progression is 400 miles a day. The total downpour was tremendous and established a "record" in many sections. The Commonwealth Meteorologist estimates (1 cubic foot of water = 62½ pounds) that over 400,000 square miles of Victoria and New South Wales the rainfall was nearly 4 inches. This represents a fall of roughly 100,000,000,000 tons of water; 250,000 tons to the square mile, or nearly 400 tons per acre. Enough water fell to fill the Assuan reservoir more than one hundred times.

Other depressions, coming also from the north, followed the remarkably rainy period of September and gave an altogether abnormally wet spring. While no positive statement can be made as to cause, it appears likely that the great southward movements of the air, which gave the heavy precipitation, resulted from an abnormal "sagging" to the southward of the thermal equator. In two and a half months, it is estimated that eastern Australia received 800,000,000,000 tons of water, nearly all drawn from tropical seas (1 inch of rainfall = 100 tons per acre, and 64,000 tons per square mile). This was equal to about 45,000,000 gallons per head of the population of the area over which the rain fell. The total fall was equal roughly to 180 billion gallons.

R. DEC. WARD.

HUMAN GEOGRAPHY

Climate and Human Evolution. In a recent paper Professor Joseph Barrell offers an interesting hypothesis as to the way in which man first came down from the trees to walk upon the solid earth (Probable Relation of Climatic Change to the Origin of the Tertiary Ape-Man, *Scientific Monthly*, January, 1917). It is now generally conceded that the great change from a four-handed, unintelligent, apelike, and arboreal creature to an intelligent manlike creature who walked on two feet and worked with two hands occurred in some part of Central Asia beyond the limits of the tropics. Pro-

fessor Barrell believes that the original man-ape would never have left the trees except under the strongest compulsion, for life on the ground is extremely dangerous for so poorly defended a creature. If the forest which formed the apes' home were to disappear, however, and he could not migrate to some other forest, he would be forced to the ground. In the Miocene period the uplifting of the Himalayas and other great ranges apparently raised an impassable barrier between northern and southern Asia. At the same time the climate of the regions north of the mountains became dry. Hence the forests gradually disappeared. Man could not follow them southward because of the mountains. Therefore, according to Professor Barrell, he was more and more compelled to betake himself to the ground. This subjected him to such extreme dangers that the cleverer, more quick-witted types—the ones that had the sense to use sticks and stones or to deceive their enemies—had a tremendous advantage. Hence mental development was at a great premium, and the human brain evolved with remarkable celerity.

A later, but nevertheless remote, phase of the effect of climate on man's evolution seems to be pictured in the ancient holy books of Persia. In a paper entitled "Iranian Migrations before History" (*Scientia*, Bologna, February, 1916) Mrs. Maunder recounts a tradition which was already hoary when put into fixed form about 2,500 years ago. The Venidad, or ancient Anti-Demoniac Law of Persia, describes sixteen good lands. The first and best of these, Airyana Vaego, was so full of "flocks and herds, men, dogs, and birds, and red blazing fires," that there was no room for more. At that time the hero Yima was warned of the approach of "fatal winters . . . that shall bring the fierce, foul frost, . . . that shall make snowflakes fall thick." Airyana Vaego became a place where "there were ten months of winter, two summer months," where "winter falls . . . with the worst of plagues." Where was this cold region? A student of Indian mythology might answer that it was in the Himalayas, for the ancient books of Kashmir preserve a similar tradition. Mrs. Maunder answers differently. She cites the tradition of a land in which the summer day is twice as long as the summer night. That would be about latitude 49° or higher. A still more northern location, however, is suggested in Venidad, for in the land whence Yima migrated "the stars, the moon, and the sun are only once [a year] seen to rise and set, and a year seems only a day." Such a description, Mrs. Maunder believes, could apply only to a region north of the Arctic Circle, where day and night each endure for months. Hence she concludes that at some time during their history the Iranians must have dwelt north of the Arctic Circle and that at that time the climate must have been much milder than at present. Later the advent of a glacial epoch or at least of a severe glacial stage—although these terms are not used—drove the people out of their inter-glacial homes.

Other parts of the old Iranian books relate how the people longed for rain through the spring and eagerly awaited the first heavy downpour about the time of the summer solstice. The reference is obviously to the monsoon rains of India. From the far north the Iranians were apparently driven to India, where they remained long enough so that their traditions became saturated with the idea of summer rains, a thing unknown in Iran. There seems good reason to accept Mrs. Maunder's idea that the traditions point to extensive migrations due to alternate epochs of stormy and of mild climate. A long residence of the primitive Iranians north of the Arctic Circle may be questioned, but if their main home was in the Altai region, for example, small bodies of wandering hunters may often have pressed so far north that they were familiar with the midnight sun.

ELLSWORTH HUNTINGTON.

GEOGRAPHICAL NEWS

A New Series of Topographical Bulletins. The National Highways Association has for some years been promoting the improvement of the main roads of the United States. To this end it enlisted the assistance of a large body of experts, which were organized into various divisions. Professor W. M. Davis is chairman of the division of physical geography, which has begun the publication of a series of special bulletins. *Physiographic Bulletin No. 1*, dated May, 1917, has just appeared. In it Professor Davis has performed the useful service of emphasizing the need for a more rapid survey of our national domain, only forty per cent of which has been topographically surveyed. The work is important from many aspects, but chiefly from that of preparedness and of travel and economic development. This first bulletin contains striking reprints from sixteen sheets of the topographical map of the United States already published by the U. S. Geological Survey. They are intended to show interesting portions of mountain and coast line and are accompanied by running comments greatly condensed in form. The bulletin closes with an appeal for the wider use of the maps of the U. S. Geological Survey and for their study by local organizations, as for example, the Boy Scouts.

Summer Session Courses in Geography

(Unless otherwise noted, the instructors belong to the faculty of the institution at which they are giving courses)

University of Alabama, University (June 5–July 18).

General Geography. Miss S. E. Luther of the Conecuh County High School, Castleberry, Ala.

Boston University, Boston, Mass. (July 2–August 11).

Economic History of the United States. Asst. Prof. C. P. Huse.

California State Normal School, Chico (June 4–9).

Geography. Mr. C. K. Studley.

University of California, Berkeley (June 25–August 4).

Physical Oceanography, Including Some Related Phenomena of Meteorology. Dr. G. F. McEwen of the Scripps Institution for Biological Research.

Economic Geography. Mr. P. S. Barnhart of the Scripps Institution for Biological Research.

The Teaching of Geography in Elementary Schools, With Special Reference to Regional Geography. Miss C. B. Kirchwey of Teachers College, Columbia University.

The Teaching of Geography in Secondary Schools. Miss C. B. Kirchwey.

Principles of Plant Ecology. Prof. Francis Ramaley of the University of Colorado. Race. Asst. Prof. T. T. Waterman.

University of Chicago (June 18–July 25 and July 26–August 31).

Physiography. Asst. Prof. A. O. Thomas of the University of Iowa. Second term.

Geographic Geology. Prof. R. D. Salisbury, first term; Assoc. Prof. R. C. Moore, second term.

Continental Evolution. Prof. R. D. Salisbury, first term; Asst. Prof. A. O. Thomas, second term.

Meteorology. Assoc. Prof. W. S. Tower.

Distribution and Causes of Rainfall. Prof. Mark Jefferson of the Michigan State Normal College at Ypsilanti. Second term.

Physiographic Ecology. Prof. H. C. Cowles and Dr. G. D. Fuller. First term.

Ecological Plant Geography: Regional and World Problems. Prof. H. C. Cowles. Second term.

Economic and Commercial Geography. Asst. Prof. W. D. Jones.

Conservation of Natural Resources. Prof. H. H. Barrows.

Geographic Influences in the History of the Interior. Prof. H. H. Barrows.

Geography of South America. Assoc. Prof. W. S. Tower.

Northern Europe. Prof. Mark Jefferson. Second term.

Geography of Asia. Asst. Prof. W. D. Jones.

Geography in the Primary Grades: Home and World Geography. Assoc. Prof. Zonia Baber.

Geography in the Grammar Grades: North America. Assoc. Prof. Zonia Baber.

Geography in the Grammar Grades: South America. Assoc. Prof. Zonia Baber.

Geography in the High School. Assoc. Prof. Zonia Baber.

Field Course in Geography in Southeastern Minnesota. Mr. C. C. Colby.

Field Course in Geography in the Mississippi Valley between LaCrosse, Wis., and Minneapolis. Mr. C. C. Colby. July 27–August 23.

Field Course in Geography in the Lower St. Lawrence Valley and the Maritime Provinces. Assoc. Prof. W. S. Tower. Sept. 1–29.

Cleveland School of Education (conducted jointly by Western Reserve University and the Cleveland Normal School), Cleveland, Ohio (June 18–July 27).

Physical Geography. Prof. W. M. Gregory of the Cleveland Normal School and Miss Hungerford.

Industrial and Commercial Geography. Prof. W. M. Gregory and Miss Hungerford.

The Teaching of Geography. Prof. W. M. Gregory and Miss Hungerford.

University of Colorado, Boulder (June 25–August 4).

Principles of Earth Science. Prof. W. E. McCourt of Washington University, St. Louis.

Climatology. Mr. N. E. A. Hinds.

Geographic Influences. Prof. W. E. McCourt.

Industrial Geography. Prof. W. E. McCourt.

Geographic and Geologic Excursion to Interesting Places in Colorado, Utah, and Wyoming. Prof. W. E. McCourt. August 4–28.

Special Lectures: (1) The New Geography; (2) The Face of the Earth; (3) Earth Sculpture; (4) Grand Canyon of the Colorado; (5) Glaciers; (6) Rocky Mountain National Park; (7) Yellowstone National Park. Prof. W. E. McCourt.

Columbia University, New York City (July 9–August 17).

Mathematical Geography. Prof. Harold Jacoby.

Introduction to Astronomy (Adapted for Teachers of Geography). Prof. Harold Jacoby.

Geodetic Surveying. Mr. William Bowie of the U. S. Coast and Geodetic Survey and assistant.

Geographic Delineation and Map Interpretation. Asst. Prof. E. M. Lehnerts of the University of Minnesota.

Physical Geography and Its Economic Aspects. Assoc. Prof. D. W. Johnson and Asst. Prof. E. M. Lehnerts.

The Interpretation of Scenery. Assoc. Prof. D. W. Johnson.

Physiography of the Western United States. Assoc. Prof. D. W. Johnson.

Commercial Geography. Prof. C. T. McFarlane.

Geography of Industry and Trade. Prof. C. T. McFarlane.

Geographic Influences in American History. Prof. A. P. Brigham of Colgate University, Hamilton, N. Y.

The Geography of New York State. Prof. A. P. Brigham.

Economic History of the United States. Prof. E. L. Bogart of the University of Illinois.

Field Work in Physiography in the Environs of New York City and the Eastern Section of New York State. Assoc. Prof. D. W. Johnson and Asst. Prof. E. M. Lehnerts.

Field Work in Glacier National Park. Asst. Prof. E. M. Lehnerts. August 21–September 1 and September 2–14.

Special Lectures: (1) The Philosophy of Present and Prospective Boundaries in Europe, Prof. A. P. Brigham; (2) Turkey and the War, Dr. Ellsworth Huntington of Yale University; (3) Surface Features of Europe as a Factor in the War, Assoc. Prof. D. W. Johnson; (4) An Interpretation of the Scenery of the White Mountains, Prof. J. W. Goldthwait of Dartmouth College; and (5) a series of three lectures on South America, Dr. Isaiah Bowman of the American Geographical Society.

Cornell University, Ithaca, N. Y. (July 9–August 17).

Physical Geography. Asst. Prof. O. D. von Engeln.

Commercial and Industrial Geography. Asst. Prof. O. D. von Engeln.

Physical Geography, Laboratory Course. Mr. E. D. Elston.

Field Course in Geography and Geology. Asst. Prof. O. D. von Engeln.

Meteorology and Climatology. Mr. L. A. Hausman of the State College of Agriculture.

Short local excursions; all-day excursions to Taughannock Gorge and Falls, July 14, Enfield Gorge and Falls, July 21, east shore of Cayuga Lake, August 11 (Prof. V. E. Monnett); and longer excursions to Niagara Falls and Gorge, July 28, and Watkins Glen, August 4.

Dartmouth College, Hanover, N. H. (July 10–August 18).

Physiography. Prof. J. W. Goldthwait.

Anthropology. Prof. H. P. Fairchild.

Harvard University, Cambridge, Mass. (July 2–August 11).

Physiographic Field Studies. Prof. W. W. Atwood.

Research in Structural or Glacial Geology. Assoc. Prof. J. B. Woodworth.

Course in Field Geology in the Rocky Mountains of Montana. Assoc. Prof. J. B. Woodworth. July 6–August 17.

Economic History of Europe and the United States during the Nineteenth Century. Prof. E. F. Gay.

University of Idaho (jointly with the Lewiston State Normal School), Moscow (June 12–July 24).

Advanced Geography. Mr. C. S. Chessman of the Lewiston State Normal School.

Geography for Teachers. Mr. C. F. Chessman.

Northern Illinois State Normal School, Dekalb (June 25–August 3).

Geography. Miss Eva Southworth.

Physical Geography. Miss Eva Southworth.

The Teaching of Geography in the Higher Grades. Miss Eva Southworth.

Western Illinois State Normal School, Macomb (June 11–July 20).

Advanced Physiography. Mr. E. L. Jay.

Meteorology.

Agricultural Geography.

Relation of Geography to Human Life.

Geography in the Grades. Mr. Herbert Bassett.

University of Illinois, Urbana (June 18–August 10).

Field Course in Geology in the Rocky Mountains in Eastern Wyoming. Prof. Eliot Blackwelder. June 20–August 15.
Plant Ecology. Dr. W. B. McDougall.

Indiana State Normal School, Terre Haute (June 18–August 31).

History of the Earth and Its Inhabitants. Prof. B. H. Schockel.
Planet, Earth, Climate. Asst. Prof. W. A. McBeth.
Elements of Geography.
Regional Geography.
North America. Asst. Prof. W. A. McBeth.
Economic and Commercial Geography. Prof. B. H. Schockel.
Historical and Regional Geography of Europe. Prof. B. H. Schockel.

Indiana University, Bloomington (June 14–August 10).

Physical Geography. Assoc. Prof. J. W. Beede.
Economic Geography. Assoc. Prof. J. W. Beede. June 11–August 24.
The Teaching of Geography. Mr. E. E. Ramsey.

University of Iowa, Iowa City (June 18–July 28 and July 30–August 25).

Physical Geography. Prof. A. C. Trowbridge and Mr. W. D. Shipton. First term.
Physical Geography. Dr. M. M. Leighton of Iowa State Teachers' College. Second term.
Geology of Soils. Prof. A. C. Trowbridge and Mr. W. D. Shipton. First term.
Field Course in Geology in the Baraboo, Wisconsin, District (co-operative with the University of Chicago). Asst. Prof. J. H. Bretz of the University of Chicago.
Field Course in Geology around Baraboo, Wisconsin. Prof. A. C. Trowbridge. August 1–31.

Johns Hopkins University, Baltimore, Md. (June 26–August 7).

Physical Geography. Mr. D. G. Thompson of Goucher College.
Economic and Commercial Geography. Mr. D. G. Thompson.

University of Kansas, Lawrence (June 7–July 18 and July 19–August 15).

Physiography. Prof. Erasmus Haworth. First term.
Summer Field Work. Asst. Prof. W. P. Haynes. First term.
Ethnology and Race Problems. Prof. F. W. Blackmar.

Western Kentucky State Normal School, Bowling Green (June 18–July 30).

Geographic Influences in American History. Miss E. C. Semple of Louisville, Ky.
Method in Teaching Geography.
Excursion to Mammoth Cave, June 15–21.

Louisiana State University, Baton Rouge (June 7–August 8).

Physiography. Prof. F. V. Emerson.
Geology and Geography of Louisiana. Prof. F. V. Emerson.

Miami University, Oxford, Ohio (June 11–July 20).

Home Geography. Prof. G. W. Hoke.
Geography of Eurasia. Prof. G. W. Hoke.
Geography of the United States. Mr. S. W. Cushing of the State Normal School, Salem, Mass.
World Geography. Mr. S. W. Cushing.

Central State Normal School, Mount Pleasant, Mich. (June 25–August 3).

Physiography. Mr. G. E. Ganiard, Superintendent of Schools, Mount Pleasant Mich.
Commercial Geography. Mr. R. D. Calkins.
Teachers' Geography. Mr. R. D. Calkins.
Geographic Methods. Mr. R. D. Calkins.

Michigan State Normal College, Ypsilanti (June 25–August 3).

An Elementary Course in Geography. Miss Mabel Weddel.
Physiography of the Lands. Miss Genevieve Clark.
Commercial Geography. Prof. Mark Jefferson.
Geography of Europe. Prof. Mark Jefferson.
Teachers' Geography. Miss Genevieve Clark and Miss Mabel Wedel.
Field Course in Geology in Southeastern Michigan. Prof. W. H. Sherzer.

University of Michigan, Ann Arbor (July 2–August 24).

Teachers' Course in Physiography. Asst. Prof. I. D. Scott and assistant.
Elementary Meteorology. Asst. Prof. I. D. Scott and assistant.
Excursion to Niagara Falls, July 20, and to the island of Put-in-Bay, Lake Erie, August 4. Asst. Prof. I. D. Scott.

University of Michigan (continued)

- Special Lectures: (1) Geology of Niagara Falls, July 18, Asst. Prof. I. D. Scott;
 (2) Geography and Politics, August 6, Prof. R. G. Gettell of Amherst College;
 (3) The Eskimos of Southern Baffin's Land and of the Belcher Islands of Hudson Bay, July 25, Mr. R. J. Flaherty of Houghton, Mich.

Western State Normal School, Kalamazoo, Mich. (June 25–August 3).

- General Geography. Mr. L. H. Wood.
 The Geography of Michigan. Mr. L. H. Wood.
 The Geography of South America. Mr. C. C. Wilcox of the Kalamazoo High School.
 The Geography of Europe. Mr. L. H. Wood.
 Commercial Geography. Mr. C. C. Wilcox.
 The Geography of American History. Mr. C. C. Wilcox.
 Review Geography. Miss Emilie Townsend.
 Special Lecture: Physical Barriers and Economic Attractions Which Have Affected the Westward Movement in the United States. Prof. C. H. Van Tyne of the University of Michigan. July 3.

University of Minnesota, Minneapolis (June 19–July 31).

- Physiography. Asst. Prof. C. J. Posey.
 Teachers' Course in Geography. Asst. Prof. C. J. Posey.
 Geography of Latin America. Asst. Prof. C. J. Posey.
 Industries and Commerce of the United States. Mr. R. J. McFall.
 Economic Geography of Foreign Countries. Mr. R. J. McFall.
 Field Work in Glacier National Park. Asst. Prof. E. M. Lehnerts. June 18–July 2.

University of Missouri, Columbia (June 7 to August 3).

- Fundamentals of Physical and Human Geography. Mr. M. E. Branom.
 Geographic Influences in American History. Mr. M. E. Branom.
 Advanced Commercial Geography. Mr. S. T. Bratton.
 Geography of North America. Mr. M. E. Branom.
 Geographic Field Trip to the Atlantic Coast. Mr. M. E. Branom. August 4–September 1.
 Teachers' Geography. Mr. S. T. Bratton.
 Economic History of the United States. Asst. Prof. H. A. Wooster.

University of Montana, Missoula (June 18–July 27).

- Physiography. Prof. J. P. Rowe, and Mr. E. E. Holmes of the College of Montana, Deer Lodge, Mont.
 Geography and Geology of Montana. Prof. J. P. Rowe and Mr. E. E. Holmes.

University of Nebraska, Lincoln (June 11–August 3).

- Physical Geography. Miss C. J. Nelson of Teachers College High School.
 Regional Geography of North America. Assoc. Prof. N. A. Bengtson.
 Geography of European Countries. Assoc. Prof. N. A. Bengtson.
 Geography of Nebraska. Assoc. Prof. N. A. Bengtson.
 Commercial Geography. Prof. G. S. Stephens.
 Elementary Geology, Physiographic, Structural, and Dynamical. Mr. R. W. Ellis.
 Geological Excursion to the Black Hills and Rocky Mountain Region. Prof. E. H. Barbour and Asst. Prof. E. F. Schramm.

University of Nevada, Reno (June 19–July 30).

- Review and Methods of Teaching Geography.

New York University, New York City (July 2–August 10).

- Principles of Economic Geography. Mr. A. M. Nielson.
 Special Topics in Geography. Prof. J. E. Woodman.
 Research in Geography and Geology. Prof. J. E. Woodman.
 Field Course in General Physiography and Geology. Prof. J. E. Woodman.

Northwestern University, Evanston, Ill. (June 25–August 4).

- General Geology: Introduction to Geology and the Physiography of the Lands. Prof. U. S. Grant.
 Geology and Physiography of the United States. Prof. U. S. Grant.
 Race Studies. Prof. S. L. Chandler.

Oberlin College, Oberlin, Ohio (June 15–August 2).

- Principles of Geography. Prof. G. D. Hubbard.
 Physical, Commercial, and Historical Geography of England. Prof. L. B. Hall.
 Ecology. Assoc. Prof. Lynds Jones.

Ohio State University, Columbus (June 21–August 16).

- Field Ecology. Prof. E. N. Transeau.
 The History of the Westward Movement to 1812. Prof. H. C. Hockett.

Ohio University and State Normal College, Athens (June 23–August 3).

Physiography. Prof. B. M. Thompson.
 Physical Geography. Prof. B. M. Thompson.
 Political Geography. Prof. B. M. Thompson.
 Methods in Geography. Prof. C. L. Martzloff.
 Commercial Geography. Asst. Prof. G. C. Parks.

University of Oklahoma, Norman (June 4–July 31).

Physical Geography. Mr. A. J. Williams, Mr. C. E. Decker, and Mr. E. W. Scudder.
 Physiography. Mr. A. J. Williams.
 Domestic and Foreign Commerce. Assoc. Prof. A. B. Adams.
 Territorial Expansion of the United States. Prof. Roy Gittinger.

George Peabody College for Teachers, Nashville, Tenn. (June 16–July 20 and July 21–August 31).

General College Geography. Mr. C. O. Sauer of the University of Michigan.
 Economic and Commercial Geography. Mr. C. O. Sauer.
 Fundamentals of Regional Geography. Prof. A. E. Parkins.
 Influence of Geography on American History, With Special Emphasis on the South.
 Prof. A. E. Parkins.
 Geography of the South. Prof. A. E. Parkins.
 The Geography and Commerce of South America. Asst. Prof. G. E. Snider of the College of the City of New York.
 People and Industries of South America. Asst. Prof. G. E. Snider.
 Geography of Europe. Mr. C. O. Sauer.
 Course in Advanced Field Geography either in the southern part of the Appalachian Highland or the area about the Great Lakes. Late July and August, or September.

Pennsylvania State College, State College (June 25–August 3).

Physical Geography. Asst. Prof. L. J. Youngs.
 Teachers' Geography. Asst. Prof. L. J. Youngs.
 The Teaching of Geography and History. Miss A. U. Wert of the Teachers' Training School, Harrisburg, Pa.
 Geography and History in Seventh and Eighth Grades. Miss A. U. Wert.
 Economic History of the United States. Dr. A. E. Martin.

University of Pennsylvania, Philadelphia (July 10–August 18).

Physical Geography. Prof. W. M. Gregory of the Cleveland Normal Training School.
 Commercial and Industrial Geography. Prof. W. M. Gregory.
 The Teaching of Geography. Prof. W. M. Gregory.
 Civics, Hygiene, and Geography [course for training of teachers for continuation schools]. Mr. L. A. Lettinger of the Philadelphia Trades School.
 The Industrial Environment. Mr. C. E. Reittel.
 History of the West, 1837–1873. Prof. L. Paxson of the University of Wisconsin.
 The North American Indian. Mr. R. T. Aitken.
 Peoples of the Pacific. Mr. R. T. Aitken.

Rhode Island Normal School, Providence.

Methods in Teaching Geography. Mr. R. M. Brown.
 Advanced Work in Geography. Mr. R. M. Brown.

University of South Carolina, Columbia (June 20–July 19).

Physical Geography. Prof. A. C. Moore.

University of South Dakota, Vermillion (June 18–July 27).

Geography and the Teaching of Geography. Mr. M. C. Helm, Superintendent of Schools, Pierre, S. D.
 Physical Geography and the Teaching of Physical Geography. Mr. M. C. Helm.
 Economic Geography. Mr. A. M. Peisch.

Syracuse University, Syracuse, N. Y. (July 9–August 17).

Physiography. Asst. Prof. A. E. Brainerd and Asst. Prof. B. W. Clark.
 Physiography of the United States. Asst. Prof. A. E. Brainerd and Asst. Prof. B. W. Clark.
 Climatology. Asst. Prof. A. E. Brainerd and Asst. Prof. B. W. Clark.
 Industrial and Commercial Geography. Prof. F. W. Roman.
 Industrial History of the United States. Asst. Prof. O. E. Randall.
 History and Geography of the South American Republics. Prof. A. S. Patterson.

University of Tennessee: Summer School of the South, Knoxville (June 19–July 27).

Home and World Geography (for primary teachers). Miss Bertha Henderson of the Humboldt State Normal School, Arcata, Cal.

University of Tennessee (continued)

North America (for teachers of grammar grades). Miss Bertha Henderson.

Review of Geography. Miss Bertha Henderson.

Geography, History, and Nature Study (for teachers of first four grades). Miss M. L. Cooper of the Memphis city schools.

University of Texas, Austin (June 13-July 26 and July 26-September 4).

General Geography. Mr. E. G. Littlejohn of the Alamo School, Galveston.

Physical Geography. Mr. E. G. Littlejohn.

Geographic Influences in History. Prof. W. L. Fleming of the Louisiana State University. First term.

Tulane University of Louisiana, New Orleans (June 11-July 21).

Geography [principles and teaching methods]. Mr. C. C. Hensen, Principal of the Newman Normal Training School, New Orleans.

University of Utah, Salt Lake City (June 11 to July 20).

Nature-Geography, Story, and Civics [primary teaching methods]. Asst. Prof. Anna Youngberg.

Geography for Grammar Grades. Asst. Prof. Anna Youngberg.

Western History [general development of the Far West from 1790 to the present]. Prof. L. E. Young.

University of Virginia, Charlottesville (June 19-August 2).

Physical Geography. Miss L. C. Kelley of the John Marshall High School, Richmond, Va.

Industrial and Commercial Geography. Miss L. C. Kelley.

Latin American Social Development [a study of the human geography of the Latin American States]. Adjunct Prof. J. C. Bardin.

University of Washington, Seattle (June 16-July 27).

Physical and Regional Geography. Asst. Prof. E. J. Saunders.

Meteorology and Climatology. Asst. Prof. E. J. Saunders.

Economic Geography of Washington. Prof. Henry Landes.

The Trade of the Pacific. Dr. G. M. Janes.

Spanish-American Civilization. Assoc. Prof. G. W. Umphrey.

Special Lectures: (1) Climatic Peculiarities of Washington; (2) Vulcanism Along the Pacific Coast; (3) Yellowstone Park; and (4) Glacier National Park. Asst. Prof. E. J. Saunders.

University of Wisconsin, Madison (June 25-August 3).

Physical and Applied Geography. Assoc. Prof. Lawrence Martin.

Glaciers and Glaciation. Assoc. Prof. Lawrence Martin.

Commercial and Industrial Geography. Prof. R. H. Whitbeck.

Geography of Wisconsin. Assoc. Prof. Lawrence Martin.

Geography of South America. Prof. R. H. Whitbeck.

Field Course in Physiography and Geology at Devil's Lake, Wisconsin. Assoc. Prof. Lawrence Martin.

PERSONAL

PROFESSOR A. P. BRIGHAM of Colgate University has in preparation a volume on the geography of New York State.

DR. C. F. BROOKS of Yale University will be engaged this summer in the Office of Farm Management of the U. S. Department of Agriculture in the application of seed-time and harvest maps to this summer's movement of farm labor.

PROFESSOR H. C. COWLES of the University of Chicago lectured on May 11 before the Geographic Society of Chicago on "The Trees of California: A Riddle in Forest Geography."

MR. G. C. CURTIS' model of the crater of Kilauea, Hawaii, has been installed in the geological section of the Harvard University Museum and was put on public exhibition on May 26.

PROFESSOR W. M. DAVIS was awarded the gold Hayden Memorial Medal on February 20 by the Academy of Natural Sciences of Philadelphia "in recognition of his distinguished work in geological science." Professor Davis is for the present occupied with work connected with the Geography Committee of the National Research Council, which has interrupted the completion of his report on the origin of coral reefs, following his Pacific voyage of 1914.

PROFESSOR C. R. DRYER is planning this summer to complete his field and research

studies in the physical and economic geography of Indiana and to prepare the results for publication.

DR. Ó. L. FASSIG of the U. S. Weather Bureau station in Baltimore went to San Juan, Porto Rico, in April on a special mission to extend and reorganize the Weather Bureau service in the West Indies. Meteorological stations are to be established in the newly acquired Virgin Islands and in Haiti, two in the western division of the island and one in the Dominican Republic, at Puerto Plata. The station in San Juan will probably become the center of the West Indian meteorological service.

PROFESSOR G. D. HUBBARD of Oberlin College is engaged in the preparation of a "Physiography of Ohio."

CAPTAIN GUNNAR ISACHSEN, who was a member of Sverdrup's second *Fram* expedition of 1898-1902, recently arrived from Christiania to spend several months in this country. It was Captain Isachsen who on this expedition surveyed Ellef and Amund Ringnes Islands and after whom is named the northwestern cape of the former island, the point jutting farthest into the unknown from this part of the American Arctic Archipelago.

PROFESSOR D. W. JOHNSON of Columbia University is giving, in addition to the summer courses noted elsewhere in this number, a course on "Map Reading and Map Interpretation" in the series of war emergency courses being conducted at Columbia University from May 8 to June 9. This course will be repeated later in the Summer Session. On May 21 Professor Johnson addressed the New York Academy of Sciences on "The Influence of Topography on the Rumanian Campaign." The subject-matter of the address was similar to that of Professor Johnson's article in this number.

MR. P. LEE PHILLIPS, Chief of the Division of Maps and Charts of the Library of Congress, has completed in manuscript a bibliographical account entitled "The First Map and Description of Ohio, 1787, by Manasseh Cutler," to be published by Lowdermilk and Co. in their "Rare Map Series," and "A List of Maps and Atlases Applicable to the World War."

MR. J. W. REDWAY, the author of well-known geographical text books, is at present engaged in researches on the dust content of the air and its relation to the spread of sporadic diseases. His results are being published mainly in medical journals.

MR. W. G. REED, who is at present attached to the Portland, Oregon, office of the U. S. Weather Bureau, is carrying out investigations in the Pacific Northwest to determine the efficiency of the various methods for protecting fruit and vegetables from frost.

PROFESSOR H. F. REID of Johns Hopkins University has been in Europe since the latter part of April as a member of a commission of six sent jointly by the Advisory Commission of the Council of National Defense and the National Academy of Sciences. Professor Reid will study problems connected with photographic surveying from aéroplanes.

DR. V. E. SHELFORD of the University of Illinois will spend the summer investigating the effects of climatic factors on the development of insect pests under the auspices of the Illinois State Laboratory of Natural History. The work will be carried on with the enlarged facilities afforded in the new University Vivarium, where various climatic conditions can be simulated.

MR. EUGENE VAN CLEEF of the Duluth, Minnesota, State Normal School is undertaking this summer a regional study of the Bayfield Peninsula and the Apostle Islands, Wisconsin.

PROFESSOR ROBERT DEC. WARD of Harvard University will give instruction in meteorology in the new school for the preliminary training of aviators, recently established at the Massachusetts Institute of Technology in co-operation with the War Department. In order to carry on this work, Professor Ward has been made a member of the teaching staff of the institute, at the same time retaining his position and carrying on his regular instruction at Harvard. Under orders from the War Department he visited Toronto early in May for the purpose of securing information regarding the instruction which is given there at the school for the preliminary training of aviators carried on by the Royal Flying Corps.

MR. E. H. WILSON of the Arnold Arboretum of Harvard University is engaged in a botanical expedition to eastern Asia. He left the United States in January and expects to return in March or April, 1918. He went first to Japan, then made a journey to the Riu Kiu Islands, a group which has been little visited by botanists. Returning to Japan he visited Oshima Island, a volcanic island south of Yokohama. He is at present in Korea, where he is going to pass the summer and early autumn, and then expects to visit Formosa.